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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/983,074 | 10/23/2001 | Eiichi Tamaki | 50099-185 | 8954 |
| 7590 10/02/2003 MCDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096 | | | EXAMINER PHAM, HAI CHI | |
| | | | ART UNIT 2861 | PAPER NUMBER |

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/983,074

Applicant(s)

TAMAKI, EIICHI

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 15-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-3, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Ramanujan et al. (U.S. 6,084,626).

Ramanujan et al. discloses a laser printer comprising a laser source for emitting a first laser beam (laser diode 11 emitting linearly polarized light), a first optical system (wave plate 29) for converting the first laser beam into a second laser beam, a diffraction grating light valve (grating modulator array 40) having a plurality of reflective elements arranged in a predetermined direction (**the individual diffraction gratings containing within each modulator site** being arranged along the z-axis) (col. 12, lines 33-37) for

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converting the second laser beam into modulated signal beams, and a second optical system (deflector 30) for directing the signal beams onto a medium (media plane 90), wherein the second laser beam is linearly polarized in a direction parallel to the predetermined direction (the incident light beam being polarized along the z-axis to match the axis of polarization of the modulator) (col. 10, lines 7-8 and col. 12, lines 37-40).

With regard to claims 2-3, Ramanujan et al. teaches the first optical system being a polarization direction converter or a phase plate (wave plate 29) for converting a polarization of the first laser beam (col. 12, lines 37-40).

Claim Rejections - 35 USC § 103

3. The following is a quotation of '35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al.

Ramanujan et al. ('626) discloses all the basic limitations of the claimed invention except for the wave plate (29) being a half-wave plate. However, Ramanujan et al. does indicate that the "wave plate 29 can be placed prior to the grating modulator array ... to modify the incident polarization (col. 7, lines 3-5) such that the first laser beam is linearly polarized in a direction matching the orientation of the grating elements of the modulator (col. 10, lines 7-15 and col. 12, lines 33-40), meaning that either the laser source could

be arranged so that the linearly polarized laser beam match the electric-field orientation of the individual grating elements of the modulator array or the use of a proper wave plate that would include a half-wave plate to provide a proper incident light polarization.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a half-wave plate in the device of Ramanujan et al. for the purpose of modifying the incident polarization of the laser beam to match with that of the grating modulator array.

5. Claims 4, 6, 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Reznichenko et al. (U.S. 6,229,650 B1).

Ramanujan et al. discloses all the basic limitations of the claimed invention including the diffraction grating modulator producing a zero-order diffracted light beam (the slit in the spatial filter 86 allowing only zero-order diffracted light beam to pass through so as to be imaged on the recording medium by the print lens 82) (Figs. 3-4), but except for the peak wavelength of the laser diode array being set within the range of 800-820 nm.

Reznichenko et al. discloses an optical imaging system comprising a laser light source (102) for emitting a first laser beam, a diffracting grating light valve (GLV 110) for modulating the first laser beam in response to an image signal to produce a zero-order diffracted signal beam (the higher ordered diffracted light beams being blocked by the stop 114) (Fig. 3), an imaging optical system (lens groups 112, 116) for irradiating said recording medium (imaging medium 200) with said zero-order diffracted signal beam (col. 4, line 36 to col. 5, line 9).

Although Reznichenko et al. does not expressly disclose the peak wavelength of the laser source being within the range of 800-820 nm, Reznichenko et al. does however teach that the GLV modulator can be adapted to different wavelengths (col. 6, line 52 to col. 7, line 6), and that an appropriate laser light source with a specific wavelength would be required in accordance with the type of recording medium being used (col. 3, lines 9-14). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select an appropriate wavelength range for the laser light source, namely from 800 to 820 nm as claimed, in the device of Ramanujan et al. as suggested by Reznichenko et al., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

On the other hand, with regard to claim 13, although Ramanujan et al. does not explicitly teach the wave plate (29) being a half-wave plate, Ramanujan et al. does indicate that the "wave plate 29 *can* be placed prior to the grating modulator array ... to modify the incident polarization (col. 7, lines 3-5) such that the first laser beam is linearly polarized in a direction matching the orientation of the grating elements of the modulator (col. 10, lines 7-15 and col. 12, lines 33-40), meaning that either the laser source could be arranged so that the linearly polarized laser beam match the electric-field orientation of the individual grating elements of the modulator array or the use of a proper wave plate that would include a half-wave plate to provide a proper incident light polarization. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a half-wave plate in the device of Ramanujan et

al. for the purpose of modifying the incident polarization of the laser beam to match with that of the grating modulator array.

Allowable Subject Matter

6. Claims 15-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of the claimed invention is the inclusion of the limitations, in the combination as currently claimed in each of the claims 15-18, that the plurality of reflective elements of the diffraction grating light valve includes a ribbon-shaped fixed reflective element having a fixed reflecting surface, and a ribbon-shaped movable reflective element having a movable reflecting surface. The combined limitations are not found taught or fairly suggested by the prior arts made of record, considered alone or in combination.

Response to Arguments

7. Applicant's arguments filed 07/11/03 have been fully considered but they are not fully persuasive. With regard to Applicant's argument concerning Ramanujan et al. ('626) not disclosing the polarizing orientation of the incident laser beam being parallel to the direction of the arrangement of the reflective elements of the diffraction grating light valve, the examiner respectfully disagrees. Indeed, Ramanujan et al. clearly discloses the individual diffraction gratings containing within each modulator site being arranged

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along the z-axis (col. 12, lines 33-37) for converting the laser beam into modulated signal beams wherein the incident laser beam is linearly polarized in the same z-axis) (col. 10, lines 7-8).

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281.. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



**HAI PHAM
PRIMARY EXAMINER**

September 13, 2003